

What is claimed is:

1. A mutant gene which codes for resistance to isoxaben and thiazolidinone herbicides and which comprises a cellulose synthase gene having the herein described nucleotide changes in the sequence of GenBank accession numbers AF027174 and AB018111.
2. A transgenic plant cell which comprises an expression cassette comprising, in the direction of transcription, a transcriptional initiation regulatory region which is functional in a plant cell, a translational initiation regulatory region which is functional in a plant cell, and a cellulose synthase gene having the herein described nucleotide changes in the
5 sequence of GENBANK accession numbers AF027174 and AB018111, wherein said transgenic plant cell is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant cell of the same species.
3. A transgenic plant part comprising a plant cell according to claim 2, wherein said transgenic plant part is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of the same plant part from a wild-type plant of the same species.

4. A transgenic plant comprising a plant cell according to claim 2, wherein said transgenic plant is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant of the same species.

5. A viable seed derived from a transgenic plant according to claim 4, wherein isoxaben and thiazolidinone-resistant cellulose synthase is synthesized by a plant grown from said seed, and wherein the plant grown from said seed is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant of the same species.

6. A transgenic plant cell according to claim 2, wherein said cell is an *Arabidopsis* plant cell which is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type *Arabidopsis* cell.

7. A viable seed derived from an *Arabidopsis* plant cell according to claim 6, wherein isoxaben and thiazolidinone-resistant cellulose synthase is synthesized by a plant grown from said seed, and wherein the plant grown from said seed is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type *Arabidopsis* plant.

8. A plant tissue culture comprising an expression cassette comprising, in the direction of transcription, a transcriptional initiation regulatory region which is functional in a plant cell, and an cellulose synthase gene having the herein described nucleotide changes in the sequence of GENBANK accession numbers AF027174 and AB018111.

9. A mutant gene encoding isoxaben and thiazolidinone-resistant cellulose synthase having an amino acid substitution at residue 998 when said residue is glycine in the corresponding wild-type cellulose synthase and aspartic acid in the resistant CS.

10. A transgenic plant cell which comprises an expression cassette comprising, in the direction of transcription, a transcriptional initiation regulatory region which is functional in a plant cell, and a cellulose synthase gene as defined in claim 9, wherein said transgenic plant cell is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant cell of the same species.

11. A transgenic plant cell as defined in claim 10, wherein said plant cell is of a monocotyledonous plant.

12. A viable seed derived from a transgenic plant according to claim 10, wherein isoxaben and thiazolidinone-resistant cellulose synthase is synthesized by a plant grown from said seed, and wherein the plant grown from said seed is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant of the same species.

13. A transgenic plant cell as defined in claim 10, wherein said plant cell is of a dicotyledonous plant.

14. A transgenic plant comprising a transgenic plant cell according to claim 10, wherein said transgenic plant is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant of the same species.

15. A mutant gene encoding isoxaben and thiazolidinone-resistant cellulose synthase having an amino acid substitution at residue 942 when said residue is threonine in the corresponding wild-type cellulose synthase and isoleucine in the resistant CS.

16. A transgenic plant cell which comprises an expression cassette comprising, in the direction of transcription, a transcriptional initiation regulatory region which is functional in a plant cell, and a cellulose synthase gene as defined in claim 15, wherein said transgenic

plant cell is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant cell of the same species.

17. A transgenic plant cell as defined in claim 15 wherein said plant cell is of a monocotyledonous plant.

18. A transgenic plant cell as defined in claim 15 wherein said plant cell is of a dicotyledonous plant.

19. A transgenic plant comprising a transgenic plant cell according to claim 15, wherein said transgenic plant is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant of the same species.

20. A viable seed derived from a transgenic plant according to claim 15, wherein isoxaben and thiazolidinone-resistant cellulose synthase is synthesized by a plant grown from said seed, and wherein the plant grown from said seed is resistant to a level of isoxaben and thiazolidinone which prevents or inhibits the growth of a wild-type plant of the same species.

21. A method of producing a transformed plant crop that, after planting, exhibits greater resistance to isoxaben and thiazolidinone herbicide than that of an isoxaben and thiazolidinone-sensitive wild-type crop plant of the same species, said method comprising producing a viable seed according to claim 20 and using said viable seed to produce said transformed plant crop.